men all over the world. In 1877 he described under the name of rogersite a mineral resulting from the alteration of samarskite. In the same year Daubrée, of Paris, named after him the mineral Lawrencite, a protochloride of iron first detected by Dr. Smith in meteorites. Dr. Smith has published in book form a collection of his memoirs of especial interest to mineralogists. He was one of the few American members of the Academy of Sciences of Paris.——At the American exhibition recently held in Boston, several States exhibited collections of minerals. North Carolina was especially well represented, making a large exhibit of beautiful and often rare species. Among the most noteworthy minerals were the following: *Gummite* in a mass weighing six and a half pounds; *uraninite* in masses of several pounds weight; crystals of *monazite*, *fergusonite* and *xenotime;* large masses of *allanite* and *samarskite*, one specimen of the latter weighing five pounds; crystals of *emerald* over five inches long; brilliant prisms and geniculations of *rutile; quartz* showing basal and other rare planes; beautiful crystals of spodumene, beryl, etc.——The rare mineral *hörnesite*, a hydrous arseniate of magnesia, has probably been identified by M. E. Bertrand accompanying nagyagite from Nagyag, Trannsylvania. The crystals of hörnesite are of a pale rose color, have a talcose cleavage and are quite soft.——According to the newspapers, "Missouri is said to have a new mineral, adamscolite, that cuts steel."——What was probably one of the richest finds of gold ever made in this country at one time, was discovered recently in Amador county, Cal., according to a paper published there, which says a pocket of quartz, found less than 100 feet below the surface, and containing about two tons in quantity, yielded from $75,000 to $100,000. Much of the quartz, it is represented, consisted of what were virtually chunks of gold.——Tin ore is reported to occur in Rockbridge county, Virginia. A vein of cassiterite, several inches in thickness, runs nearly east and west through a gneiss containing large crystals of feldspar with mica and quartz.

BOTANY.[1]

A NEW SPECIES OF INSECT-DESTROYING FUNGUS (see AMER. NAT., Vol. XV, p. 52).

Entomopthora calopteni, n. sp.—I. Empusa stage, not seen.

II. Tarichium stage: Oöspores globular, or from pressure somewhat irregular in outline, colorless, 36 to 39μ. in diameter; walls thick (4μ.), colorless, smooth; protoplasm granular, often as if composed of many small cells, often with a large round vacuole.

Occurring as a clay-colored mass in the body cavity and femora of *Caloptenus differentialis*. Ames. Iowa, Aug. and Sept., 1883.

This is much like the species described by Peck (31st Report

[1] Edited by PROF. C. E. BESSEY, Ames, Iowa.

N. Y. State Museum, p. 44) as infesting the seventeen-year Cicada, but the oöspores in the latter are much smaller, being but 1.6 to 2μ., and in one case 3.8 to 5μ. The same fungus was described briefly by Leidy (Smithsonian Contrib., Vol. v, Art. 2, 1851), who gave the size of the spores as 9 to 18μ. long by 7 to 11μ. wide. The great difference in size between the spores in the species infesting Caloptenus and those in Cicada shows them to be distinct.—*C. E. Bessey.*

Notes on Gymnosporangium and Rœstelia.—In my orchard is a row of red cedars (*Juniperus virginiana*) running east and west. At a distance of sixteen feet north of this row of cedars is a row of apple trees, and at distances of sixteen and thirty-two feet on the south side of the cedars are also rows of apple trees. For eight or ten years now, in the latter part of May, the cedars are heavily laden with *Podisoma macropus* and *Gymnosporangium clavipes*, and in the early days of June when these fungi have begun to dry up, the leaves of the apple trees standing on each side begin to show the spermogonia of Rœstelia; but it is always noticeable that the apple trees are not all affected to the same extent. For instance, on a tree of the variety known here as Fallawater, and standing in the row of trees north of the cedars, almost every leaf is invariably spotted with spermogonia, and later in the season, in August, is literally loaded with Rœstelia (N. A. F. 1086. d.). Next to this tree stands one of the variety known as Summer Sweet. Part of the leaves on this tree show the spermogonia in the spring but never produce the Rœstelia. Next stands a Baldwin. This, like the Fallawater, shows an abundance of the spermogonia, and later of the Rœstelia. On the south side of the cedars the first row of trees is of the variety called Yorkshire Russett (the trees imported from England). These trees all show spermogonia in the spring, but never mature any Rœstelia. In the next row south are several varieties of apples, among which the English Russett shows the greatest abundance of spermogonia, and matures a few imperfect specimens of Rœstelia. From the above statement it will be seen that all the apple trees, even those standing at the same distance from the cedars, are not equally affected, and it is to be noted that those which are the most affected are all varieties which do not flourish in this locality, among which notably are the Baldwin and English Russett. This seems to indicate that an enfeebled condition of growth in a tree, renders such a tree more liable to the attacks of the parasitic fungi mentioned, and this may have a direct bearing on the artificial culture of Rœstelia, for although this has not, so far as I know, been demonstrated by actual experiment, it is altogether probable that seedlings raised from apples grown on a tree which annually bears a crop of Rœstelia, would be more liable to the attacks of this fungus than seedlings raised from apples grown on trees not so affected. I am led to suspect this the more from having the past winter raised some seedling apple trees in a flower pot in the house, and from my utter failure to produce even spermogonia on these seedlings, although at the proper time last spring I placed fresh spores of Gymnosporangium on their leaves. In order to test this matter more fully I have saved seeds from apples grown on the *Baldwin*, which, as stated, was badly affected with Rœstelia, and from apples grown on a tree next to it which was unaffected with Rœstelia, in order to ascertain, if possible, whether the seedlings from these two trees will show any difference in their susceptibility to receive the inoculation of the Gymnosporangium spores.—*J. B. Ellis, Newfield, N. J., Oct., 1883.*

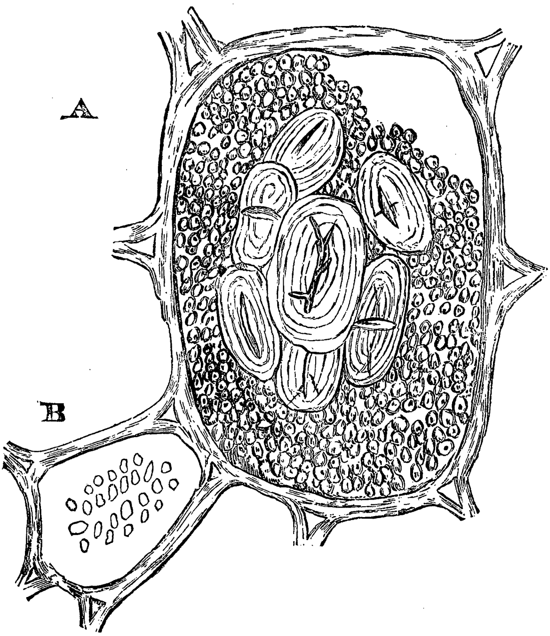
THE STRUCTURE OF THE CELL-WALL IN THE COTYLEDONARY STARCH-CELLS OF THE LIMA BEAN.—Several years since, while studying in the microscopical laboratory of the University at Lewisburg, Pa., I undertook a thorough study of the seed of the Lima bean (*Phaseolus lunatus*). Among other things of interest I noticed a peculiarity in the structure of the walls of the cotyledonary starch-cells such as I have never seen noted in any work on structural botany. The following is an abstract from my notes:

If the contents of the large cells (starch-cells of cotyledon), or any except the procambium and epidermal cells, be removed, the end of the cell presents a very peculiar appearance (taken in very thin section from alcohol eighty per cent menstruum).

It seems to be perforated with holes (Fig. B), often so numerous and large as to give to the wall the appearance of lace-work or delicate net-work. The cause of this phenomenon for a long time eluded discovery. The transverse section of the cell-wall showed not the slightest evidence of perforation, and no very great difference in thickness in the various parts, the average thickness being about .0788$^{mm.}$ But by carefully changing the focus the middle lamella, which with good light may be readily distinguished, is seen to vary very much in thickness at different points, closely resembling a string of beads considerably separated from each other; also where the middle lamella is thickest the outer lamellæ become thinner (Fig. C). Now the central portion of the wall contains more moisture than the outer lamellæ, and would differ greatly in its refractive power from them; this difference being increased by their reciprocal relations of thickness, hence this might afford an explanation for the peculiar appearance. Moreover, it only occurs in the central portion of the cell, which may be due to absence of the efficient cause in the other parts, or to the interference of double walls at intercellular spaces which were quite large.

The observations were made with a Beck's "National," ⅛ inch objective; B eye-piece, with the tube of the microscope extended, A

B



C

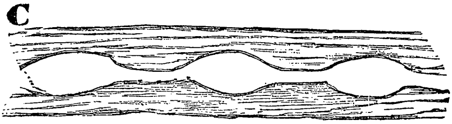


FIG. A.—A cotyledonary cell containing starch and aleurone. FIG. B.—A cell from which the starch and aleurone have been removed, showing the appearance of cell-wall when seen in front view. FIG. C.—Structure of the wall in transverse section. (All the figures much magnified.)

and required most favorable position.—*Wm. Frear, Washington, D. C.*

NEW FLORIDA FUNGI. I.—*Aylographum quercinum* E. & M.—Perithecia scattered over the upper surface of the leaf, flattened, linear, often branched, opening by a longitudinal fissure along the center, 180–350 × 90–100μ., bordered with a fringe of brown, creeping hyphæ; asci ovate or subglobose, 20–30 × 18–20μ., abruptly and briefly stipitate; paraphyses none; sporidia crowded, obovate, two-celled, 10–14 × 6–7½μ. Differs from *A. vagum* Desm., and *A. sarmentorum* De Not., in its larger perithecia and sporidia. On leaves of *Quercus virens*.

Peziza (Mollisia) gelatinosa E. & M.—Sessile, gelatinous, hyaline with a tinge of rose color, ¼^{mm} diam., convex, immarginate; asci obovate, 35–40 × 15–20μ.; paraphyses recurved and bent with a small knob-like swelling at the tip; sporidia 2–3 seriate, fusiform, subhyaline; endochrome three times divided, 12–16 × 3–3½μ., much as in *H. castaneum* S. & E. On living leaves of *Persea palustris*, on patches of sterile mycelium of some Meliola.

Helotium maculosum E. & M.—Orbicular sessile, $\frac{1}{6}^{mm}$ diam., plane or convex when fresh, concave when dry, disk dull, dirty flesh-color, darker outside with a few brown bristle-like, faintly-septate hairs arising from near the base; asci oblong-clavate, 55 × 12μ.; paraphyses rather stout; sporidia biseriate, broad fusiform, endochrome three times divided, 16–20 × 4–5μ. Differs from *H. castaneum* S. & E., in its duller color, bristle-like hairs and larger, 3-septate sporidia. On pale brown spots on living leaves of *Persea palustris*.

Meliola manca E. & M.—Mostly epiphyllous in small ($1–2^{mm}$) suborbicular patches thickly scattered over the leaf and often subconfluent. Prostrate hyphæ with opposite branches and short, obovate, alternate, obtuse branchlets (haustoria?); erect hyphæ (bristles) none; perithecia subglobose, about 200μ. diam., collapsing, papillose, appendages none; asci ovate-oblong, mostly two-spored; sporidia oblong-cylindrical, brown, 3-septate, constricted at the septa, slightly curved and a little flattened, 35–43 × 12–15μ. On living leaves of *Myrica cerifera*.

Meliola cryptocarpa E. & M. — Mostly epiphyllous, forming small ($2–4^{mm}$) patches thickly scattered over the leaf and often confluent. Prostrate hyphæ pale brownish, irregularly branched and septate, bearing numerous oblong-fusiform, pale brown, 3–4 septate conidia, 30–40 × 5–9μ., obtuse or acute above and contracted below into a short stipe; erect bristles, abundant, simple, multiseptate, black, tips entire and paler; perithecia not abundant, often sterile, small, collapsing, surrounded at base with a few diverging brown septate appendages which, like the bristles of the hyphæ, are more or less crisped or undulate above; asci oblong-ovate, containing eight oblong or oblong clavate or narrowly elliptical, crowded, brown, 3–5 septate, 30–50 × 10–12μ. sporidia. On leaves of *Gordonia lasianthus*.

Asterina delitescens E. & M.—Mycelium thin, black, epiphyllous, forming small ($2-4^{mm}$) orbicular patches, composed of much branched, closely appressed hyphæ on which are seated the flattened crowded (75–100μ.) perithecia of radiating-cellulose structure; asci 30–35 × 18–22μ.; obovate or subglobose; sporidia pale yellowish, 2-celled, ovate-oblong, 15–18 × 6–7μ. On living leaves of *Persea palustris*.

Outwardly this has much the same appearance as *A. pelliculosa* Berk., but the specc. in Rav. F. Am., No. 75, have dark brown, strongly constricted sporidia 35 × 19μ. (16–20μ. long in Sacc. Syll.), and the mycelium is of a different character. *A. fimbriata* Kalch. & Cke., has the perithecia on small brown spots.

Asterina carnea E. & M.—Hypophyllous on a thin, black-brown, subcrustose mycelium composed of closely appressed, subanastomosing brown hyphæ extending for the most part along the margin of the leaf or forming orbicular patches about $\frac{1}{2}^{cm}$ diam., on which are seated the crowded, small (55–75μ.) subglobose (astomous ?) perithecia which are flesh-colored under the pocket lens and bright straw color under a higher power, and contain 4–8 obovate sessile asci 30–40 $\times$ 22–35μ., with eight, ovate 2-celled sporidia 16–17 $\times$ 7–8μ. almost exactly like those of the preceding species, having the endochrome divided into two distinct parts separated and surrounded by a hyaline border. On living leaves of *Persea palustris.—J. B. Ellis, Newfield, N. J., and Dr. Geo. Martin.*

Botanical Notes.— In the October *Overland Monthly*, Dr. Parry contributes an interesting article upon "Early Botanical Explorers of the Pacific coast." The greater part of the article is taken up with an account of the labors of David Douglas, extending from 1825 to 1834, in which year he met his tragic death. Briefer mention is made of Dr. Thomas Coulter (1831 to 1833), Thomas Nuttall (1834–6), Theodore Hartwig (1846), and Wm. Lobb (1850).——Strasburger concludes that impregnation (fertilization) is essentially a union of cell nuclei. The nucleus must then be regarded as the sexual organ of the cell. Is its presence in other than sexual cells, in complex plants, simply a persistence of a structure which is no longer of use ? Has the division of labor in the community of cells, while resulting in the development of a few special sexual individuals, been accompanied by a suppression of sexuality in all the rest ? Are ordinary cells (non-sexual cells) comparable to the "neuters" or workers in the bee colony ?——A. P. Morgan continues his Mycologic Flora of the Miami valley in the Jour. Cin. Soc. Nat. Hist. Species of fourteen genera from Coprinus to Lenzites are described. Of these five are new to science, viz., *Coprinus squamosus*, *Hygrophorus lauræ*, *Russula incarnata*, *Marasmius fagineus* and *M. capillarus*. Excellent lithographs are given of the first and second.——Fascicle VI of Van Heurck's Synopsis des Diatomées de Belgique has lately been received. It completes the plates, which are now to be followed by a volume of text. There are 132 plates.——Henry Brooks, of Boston, has prepared sets of sections of woods arranged for instruction in schools. The sections are about 2 $\times$ 4 inches, and are neatly mounted between plates of mica. Three sections (one cross and two longitudinal) are given for each kind of wood, and these are thin enough to make their study with the naked eye, or with a low power, very easy and instructive. It is to be hoped that many schools will supply themselves with these sets.